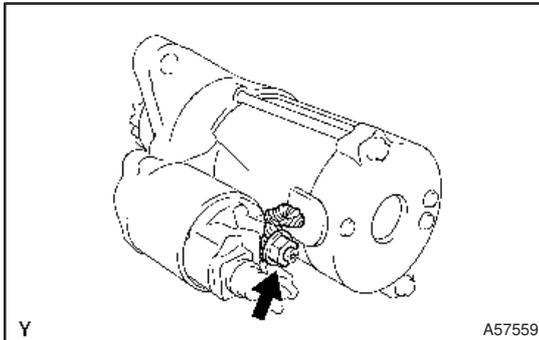


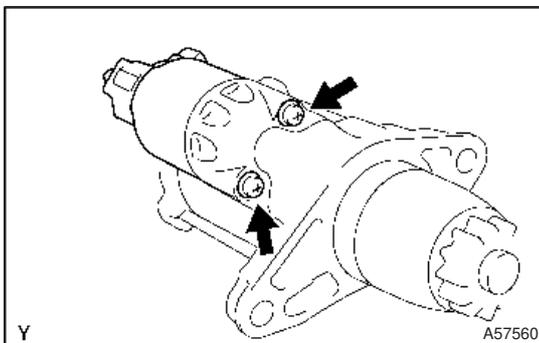
# STARTER ASSY(1.3KW) (1AZ-FE) OVERHAUL

1906L-01



## 1. REMOVE REPAIR SERVICE STARTER KIT

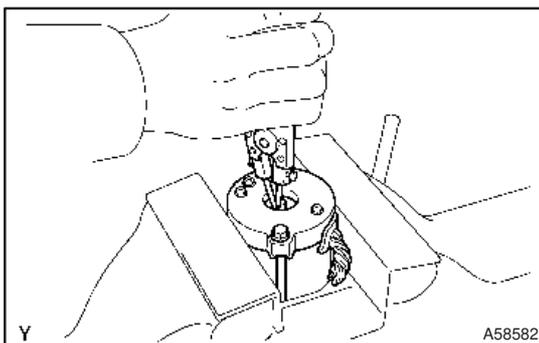
- (a) Remove the nut, and disconnect the lead wire from the repair service starter kit.



- (b) Remove the 2 screws holding the repair service starter kit to the starter housing.  
 (c) Remove the repair service starter kit.  
 (d) Remove the return spring and plunger.

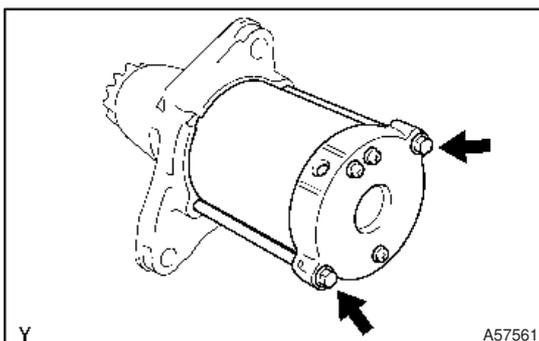
## 2. REMOVE STARTER COMMUTATOR END FRAME COVER

- (a) Using a screwdriver, remove the cover.



## 3. REMOVE STARTER COMMUTATOR END FRAME ASSY

- (a) Using snap ring pliers, remove the snap ring and plate washer.

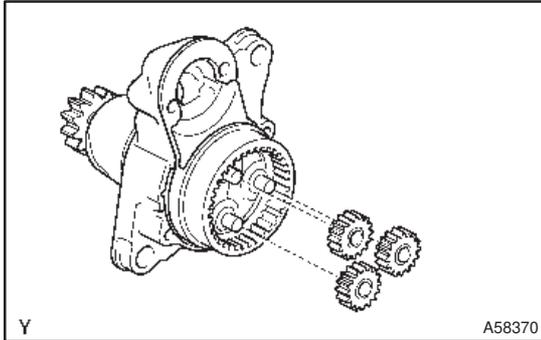


- (b) Remove the 2 through bolts, and pull out the starter yoke assembly together with the commutator end frame assembly.

## 4. REMOVE STARTER YOKE ASSY

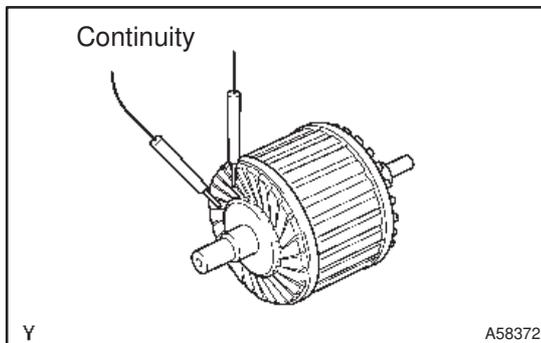
- (a) Remove the starter armature assembly from the starter yoke assembly.

## 5. REMOVE STARTER ARMATURE PLATE



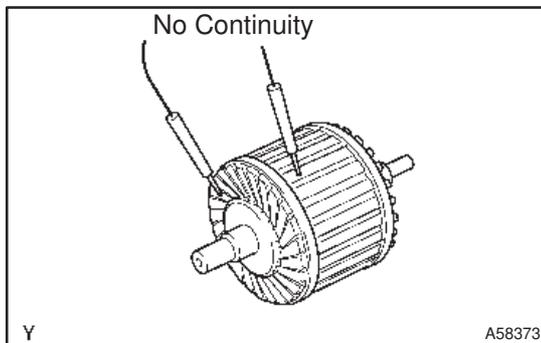
## 6. REMOVE PLANET GEAR

- (a) Remove the 3 planetary gears.

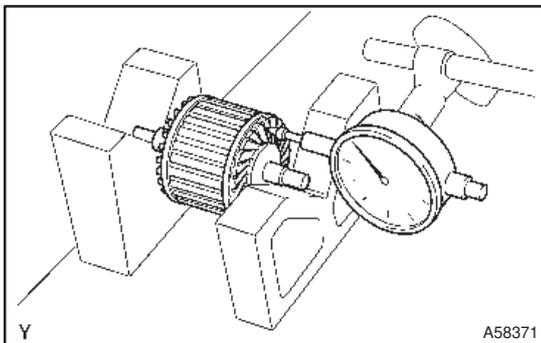


## 7. INSPECT STARTER ARMATURE ASSY

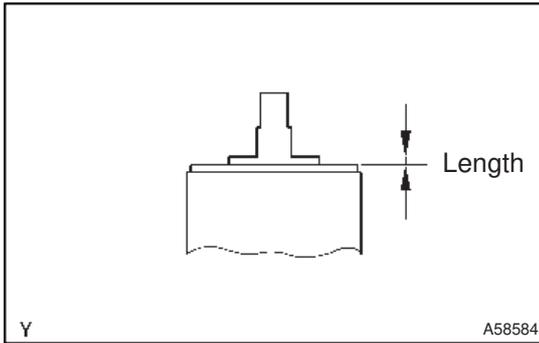
- (a) Check the commutator for open circuit.
- (1) Using an ohmmeter, check that there is continuity between the segments of the commutator.
- If there is no continuity between any segments, replace the armature.



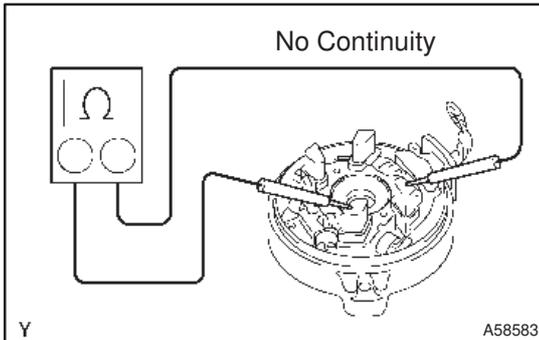
- (b) Check the commutator for ground.
- (1) Using an ohmmeter, check that there is no continuity between the commutator and armature coil core.
- If there is continuity, replace the armature.



- (c) Check the commutator for dirty and burn on surface. If the surface is dirty or burnt, correct it with sandpaper (No.400) or a lathe.
- (d) Check for the commutator circuit runout.
- (1) Place the commutator on V-blocks.
- (2) Using a dial indicator, measure the circle runout.
- Maximum circle runout: 0.05 mm (0.0020 in.)**
- If the circle runout is greater than maximum, replace the armature.



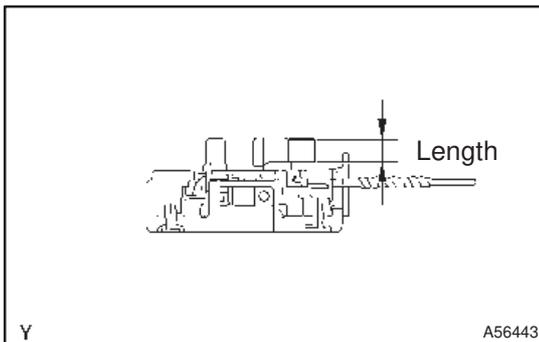
- (e) Using vernier calipers, measure the commutator length.  
**Standard length: 3.3 mm (0.1299 in.)**  
**Maximum length: 4.0 mm (0.1575 in.)**  
 If the length is greater than maximum, replace the armature.



## 8. INSPECT STARTER COMMUTATOR END FRAME ASSY

- (a) Check the brush holder.  
 (1) Using an ohmmeter, check that there is no continuity between the positive (+) and negative (-) brush holders.

If there is continuity, repair or replace the starter commutator end frame assembly.



- (b) Using vernier calipers, measure the brush holder length.  
**Standard length: 9.0 mm (0.3543 in.)**  
**Maximum length: 4.0 mm (0.0787 in.)**

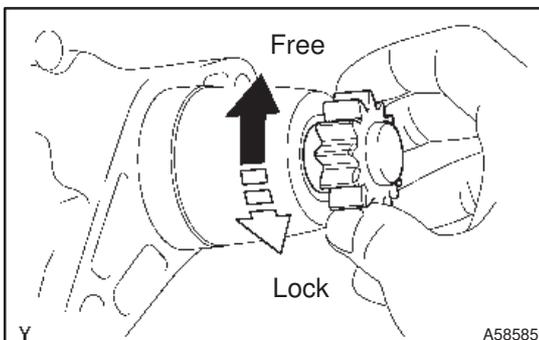
If the length is greater than maximum, replace the starter commutator end frame assembly.

## 9. INSPECT MOTOR TERMINAL STARTER KIT

- (a) Check the gear teeth on the planetary gear, internal gear and starter clutch for wear or damage.

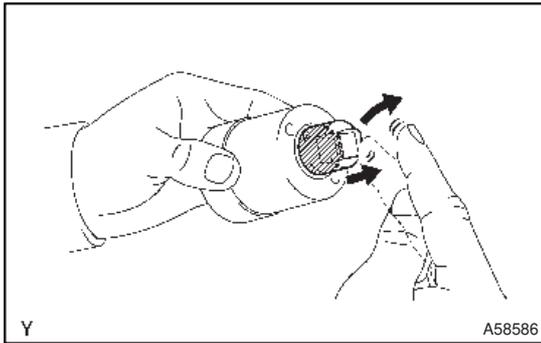
If the gear is damaged, replace it.

If damaged, replace the gear or clutch assembly. If damaged, also check the drive plate ring gear for wear or damage.



- (b) Check the starter clutch.  
 (1) Rotate the clutch pinion gear clockwise and check that it turns freely. Try to rotate the clutch pinion gear counterclockwise and check that it locks.

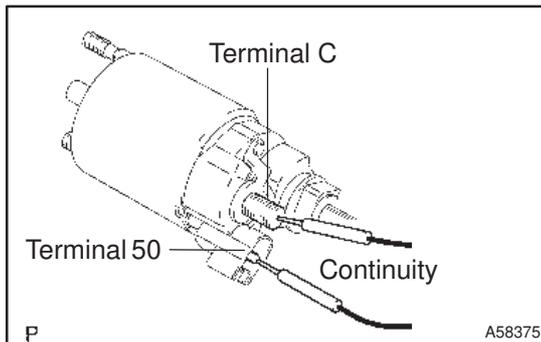
If necessary, replace the starter clutch.



## 10. INSPECT REPAIR SERVICE STARTER KIT

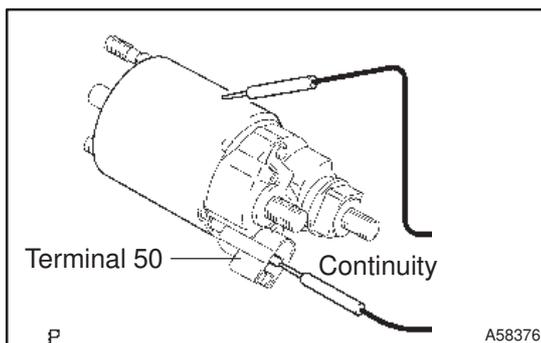
- (a) Check the plunger.
- (1) Push in the plunger and check that it returns quickly to its original position.

If necessary, replace the repair service starter kit.



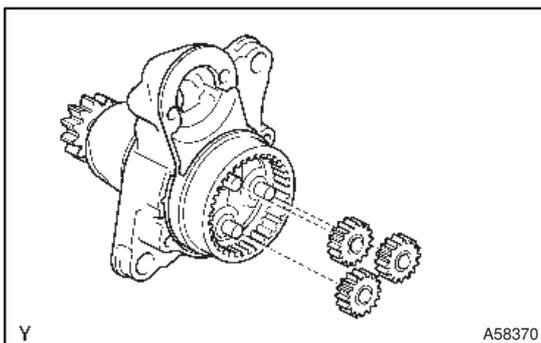
- (b) Check the pull-in coil for open circuit.
- (1) Using an ohmmeter, check that there is continuity between terminals 50 and C.

If there is no continuity, replace the repair service starter kit.



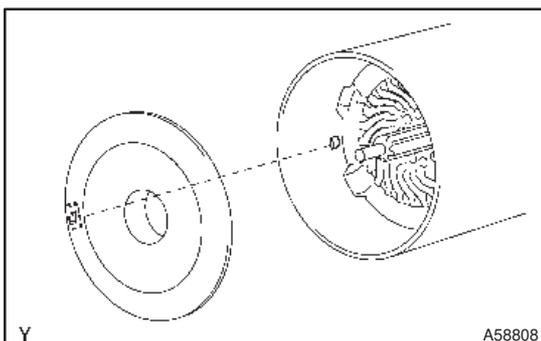
- (c) Check the hold-in coil for open circuit.
- (1) Using an ohmmeter, check that there is continuity between terminal 50 and the switch body.

If there is no continuity, replace the repair service kit.



## 11. INSTALL PLANET GEAR

- (a) Apply grease to the planetary gears and pin parts of the planetary shaft.
- (b) Install the 3 planetary gears.
- (c) Align the cutout of the plate with the protrusion inside the shock absorber.

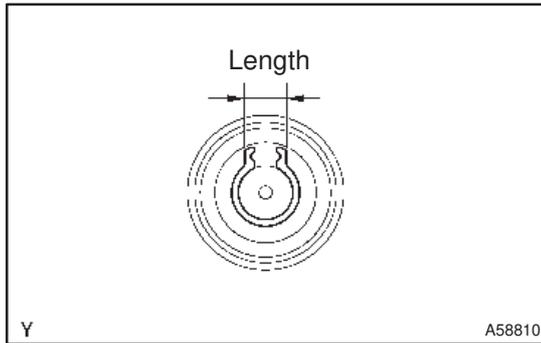


## 12. INSTALL STARTER ARMATURE PLATE

- (a) Apply grease to the planetary gears and pin parts of the planetary shaft.
- (b) Align the cutout of the plate with the protrusion inside the shock absorber, and install the plate.

### 13. INSTALL STARTER ARMATURE ASSY

- (a) Apply grease to the washer plate and armature shaft.
- (b) Install the armature shaft to the starter commutator end frame assy.
- (c) Using snap ring pliers, install the plate washer and new snap ring.

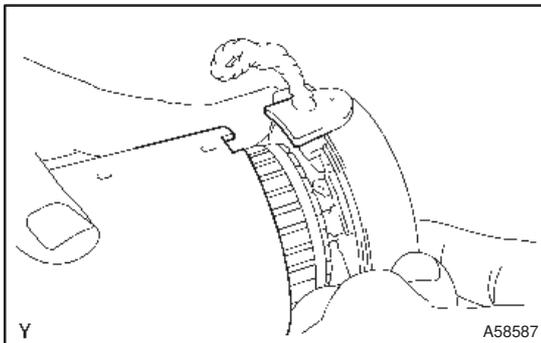


- (d) Using vernier calipers, measure the snap ring.

**Maximum length: 5.0 mm ( 0.1969 in.)**

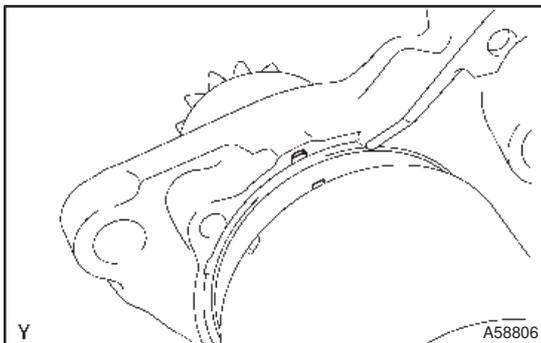
If the length is greater than maximum, replace the new snap ring.

### 14. INSTALL STARTER COMMUTATOR END FRAME COVER



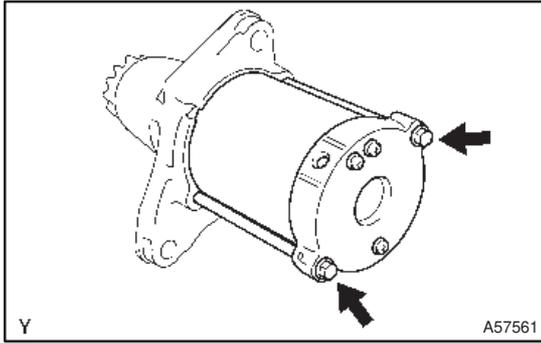
### 15. INSTALL STARTER YOKE ASSY

- (a) Align the starter commutator rubber end frame with the cutout of starter yoke.
- (b) Install starter yoke assy to starter commutator end frame.

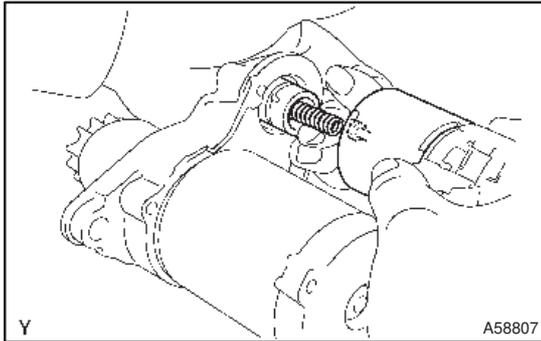


### 16. INSTALL STARTER COMMUTATOR END FRAME ASSY

- (a) Align the starer yoke assy with the cutout of motor terminal starter kit.

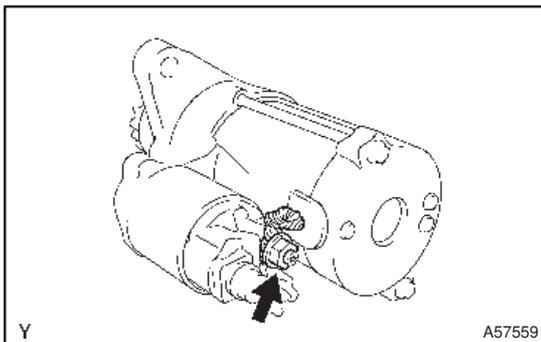


- (b) Install the starter yoke assy with the 2 through bolts.  
**Torque: 6.0 N·m (61 kgf·cm, 52 in·lbf)**



#### 17. INSTALL REPAIR SERVICE STARTER KIT

- (a) Apply grease to the plunger and hook.  
 (b) Hang the plunger hook of the repair service starter kit to the drive lever.  
 (c) Install the plunger and return spring.  
 (d) Install the repair service starter kit with the 2 screws.  
**Torque: 7.5 N·m (80 kgf·cm, 69 in·lbf)**  
 (e) Apply grease to the nut of the lead wire.



- (f) Connect the lead wire to the terminal with the nut.  
**Torque: 6.5 N·m (66 kgf·cm, 58 in·lbf)**